Quiz 4

Due: 28th April 2021

Instructions: Legibly complete each of the following on lined paper and submit on Gradescope. Collaboration and outside help (in any form) are forbidden.

1. Let $B = \{1 + x, 1 + 2x + x^2, x + 2x^2\}$, $D = \{x^2, 2 + x, 2x\}$, and $E = \{1, x, x^2\}$, and let $L\colon \mathcal{P}_2(\mathbb{R}) \to \mathcal{P}_2(\mathbb{R})$ be defined by $L(a + bx + cx^2) = (a + b + c) + (a + b)x + (a + b)x^2$.
   (a) Prove B and D are bases of $\mathcal{P}_2(\mathbb{R})$.
   (b) Compute $\text{Rep}_{B,D}(\text{id})$.
   (c) Compute $\text{Rep}_{D,B}(\text{id})$.
   (d) Compute $\text{Rep}_{E,E}(L)$.
   (e) Compute $\text{Rep}_{B,D}(L)$.
2. Draw Chris's favourite picture.